Exercise 3.1-1

Class Exercises and Quick Questions to

3.1 Thin Films - General

Here are some class exercises and quick questions:

- Interference causes the color of a thin film and betrays its thickness? Explain!
- Give examples of what "thin" could mean in relation to *intrinsic* length scales. Provide (and discuss briefly) some intrinsic lengths, in particular with respect to semiconductors
- Give a few numbers for the meaning of "thin":
 - Thickness of a human hair ≈≈ ????
 - Thickness of a gate oxide in an integrated transistor ≈≈ ????
 - Thickness of antireflection layers of optical lenses ≈≈ ????
 - Thickness of a thin film solar cell ≈≈ ????
 - Other examples you can come up with ???
 - Give some examples of thin film applications outside of semiconductor technology.

Give the equation for the capacity **C** of a parallel plate capacitor with plate area **A** for a maximum voltage of **10 V**. How can you achieve maximum capacity and what are the limits? Hint: Consider field strength and relvant intrinsic length scales.